# APPENDIX H

**Dolores Public Lands Office**
**Lower Disappointment Landscape**
**Evaluation of Land Health Assessment**
**Status of the Resource Conditions**
Rangeland Health Standards H-4180-1

Grazing Allotment Name Gypsum Valleys Number 8068
Acres: Federal 41,131 Private Owned 4,111
Date of Evaluation and Determination June 2015

Indicators used in Health Assessment (Interpreting Indicators of Rangeland Health version 3, Technical reference 1734-6, 2000)

| Attributes > / Indicators | Soil/Site Stability | Hydrologic Function | Biotic Integrity |
|---|---|---|---|
| Rills | X | X | |
| Water flow patterns | X | X | |
| Pedestals and/or terracettes | X | X | |
| Bare Ground | X | X | |
| Gullies | X | X | |
| Wind-scoured blowouts and/or deposition areas | X | | |
| Litter movement | | X | |
| Soil surface resistance to erosion | X | X | X |
| Soil surface loss or degradation | X | X | X |
| Plant community composition and distribution relative to infiltration and runoff | | X | |
| Compaction layer | X | X | X |
| Functional/structural groups | | | X |
| Plant mortality/decadence | | | X |
| Litter amount | | X | X |
| Annual production | | | X |
| Invasive plants | | | X |
| Reproductive capability of perennial plants | | | X |
| Biological soil crusts | X | X | X |

**Data sources used in evaluation:**

- 2006 Lower Disappointment Rangeland Health Assessment - TR1734-6
- Long-term compositional trend of vegetation and ground cover – monitoring transects
- Actual livestock use records
- Proper Functioning Condition Ratings for streams TR1737-15
- Noxious weed inventory
- Colorado Natural Heritage Program – TES species database
- Precipitation records Norwood, Uravan.
- San Miguel County Soil Survey, unpublished
- Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado, Environmental Assessment, June 1996
- Water source inventory – San Juan Resource Area
- Range Land Improvement inventory – San Juan Public Lands GIS inventory
- Status of Water Quality in Colorado – 2006 report
- State of Colorado 2006 303(d) list

**Dolores Public Lands Office**
**Determination Record – Gypsum Valleys Allotment**

**Statement of Achievement or Non-Achievement for each Standard:**

**1) Upland soils** exhibit infiltration and permeability rates that are appropriate to soil type, climate, landform, and geologic processes. Adequate soil infiltration and permeability allows for the accumulation of soil moisture necessary for optimal plant growth and vigor, and minimizes surface runoff.

Sylvie's Pocket, River and Magpie pasture (4,755 acres, 37% of usable allotment acres)
Standard achieved ___X___ Making significant progress towards achieving _____ Not achieved _____.

Coyote wash, Raven, Bullington, Carnation, The Gap, West Lavender, East Lavender, Hughes Gyp and Dunham pastures (7,957 acres, 63% of usable allotment acres)
Standard achieved _____ Making significant progress towards achieving _____ Not achieved ___X___.

**2) Riparian systems** associated with both running and standing water, function properly and have the ability to recover from major disturbance such as fire, severe grazing, or 100-year floods. Riparian vegetation captures sediment, and provides forage, habitat and bio-diversity. Water quality is improved or maintained. Stable soils store and release water slowly.

Standard achieved _____ Making significant progress towards achieving ___X___ Not achieved _____.

**3) Healthy, productive plant and animal communities of native and other desirable species** are maintained at viable population levels commensurate with the species and habitat's potential. Plants and animals at both the community and population level are productive, resilient, diverse, vigorous, and able to reproduce and sustain natural fluctuations, and ecological processes.

River and West Lavender pastures (1,237 acres, 10% of usable allotment acres)
Standard achieved ___X___ Making significant progress towards achieving _____ Not achieved _____.

Coyote wash, Sylvie's pocket, Raven, Bullington, Magpie, Carnation, The Gap, East Lavender, Hughes Gyp and Dunham pastures (11,475 acres, 90% of usable allotment acres)
Standard achieved _____ Making significant progress towards achieving _____ Not achieved ___X___.

**4) Special status, threatened and endangered species** (federal and state), and other plants and animals officially designated by the BLM, and their habitats are maintained or enhanced by sustaining healthy, native plant and animal communities.

Standard achieved ___X___ Making significant progress towards achieving _____ Not achieved _____.
**See Note on page 7 regarding rare plants associated with Gypsum soils in Magpie pasture**

**5) The water quality** of all water bodies, including ground water where applicable, located on or influenced by BLM lands will achieve or exceed the Water Quality Standards established by the State of Colorado. Water Quality Standards for surface and ground waters include the designated beneficial uses, numeric criteria, narrative criteria, and anti-degradation requirements set forth under State law as found in (5 CCR 1002-8), as required by Section 303 (c) of the Clean Water Act.

Standard achieved ___X___ Making significant progress towards achieving _____ Not achieved _____.

**If one or more Land Health Standards are not being achieved list reasons for not meeting and indicators used, list causal factor and list evidence used to support listed causal factors:**

**Standard 1 – Upland Soils**

**1) List reasons for not meeting and indicators used**

- For the Gypsum Valleys Allotment as a whole, more than half of the rated acres fell within the "Moderate" or "Moderate to Extreme" rangeland health ratings for the Soil and Site Stability and Hydrologic Function Attributes. This places the majority of the acres in the "at risk" or "beyond at risk" level, with recovery questionable without some changes to current management. The Sylvie's Pocket, River and Magpie pastures were exceptions with less than half of the pasture acres rating "Moderate" or above.
- The Soil and Site Stability attribute rated "Moderate" for 54% of rated acres and "Moderate to Extreme" for 21% of rated acres. The Hydrologic Function attribute rated "Moderate" for 50% of rated acres and "Moderate to Extreme" for 23% of rated acres. The Gap, Carnation, Bullington and Coyote Wash had a high proportion of rated acres in the "Moderate to Extreme" category (see table 1).

**Table 1**

**Proportion of acres within each health rating category, by pasture, for the health attributes Soil and Site Stability and Hydrologic Function**

| 2006 Rangeland Health | Soil and Site Stability | | | | | Hydrologic Function | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Gypsum Valleys Allotment Pasture | None to Slight | Slight to Moderate | Moderate | Moderate to Extreme | Extreme to Total | None to Slight | Slight to Moderate | Moderate | Moderate to Extreme | Extreme to Total |
| Coyote Wash | | 64% | | 36% | | | | 64% | 36% | |
| Sylvies Pocket | | 100% | | | | | 57% | 43% | | |
| Raven | | | 100% | | | | | 100% | | |
| Bullington | | | 73% | 27% | | | 73% | 27% | | |
| River | 73% | | 27% | | | | 73% | 10% | 17% | |
| Magpie | | 52% | 48% | | | | 52% | 48% | | |
| Carnation | | | 62% | 38% | | | | 62% | 38% | |
| Dunham | | | 100% | | | | | 100% | | |
| West Lavender | | | 100% | | | | | 100% | | |
| East Lavender | | | 100% | | | | | 100% | | |
| Hughes Gyp | | | 93% | 7% | | | | 93% | 7% | |
| The Gap | | | 44% | 56% | | | | 22% | 78% | |
| Gypsum Valleys Total | 5% | 20% | 54% | 21% | | | 26% | 50% | 23% | |

- Indicators contributing to the ratings follow: (see attached table A for details on each indicator and rating by pasture, field sheets with photos are filed)
  - Presence of waterflow patterns: For most visited sites, waterflow patterns were more numerous and extensive than expected with deposition and cut areas common. Connectivity between flow patterns occurred in most sites, parts of West Lavender and Sylvie's Pocket were exceptions. In parts of the The Gap pasture extensive overland flow was more apparent than waterflow patterns.
  - Number and height of erosional pedestals and/or terracettes: For most pastures pedestals were evident, especially in waterflow patterns, terracettes were occasional. For the East Lavender and Bullington pastures and parts of The Gap, Carnation, River and Coyote Wash pastures, pedestaled plants and shrubs were numerous with common terracettes.

- Bare ground: Ratings varied from "Moderate" to "Moderate to Extreme" with one "Extreme to Total" in these Gypsum Valleys pastures. Pastures with the highest bare ground values and more extreme ratings were The Gap (50 to 80% bare ground), Bullington (60 to 70% bare ground) and parts of the River and Coyote Wash pastures (60 to 70% bare ground).
- Amount of litter movement: Most litter movement was smaller size classes in scattered concentrations around obstructions and in depressions. A few pastures (East Lavender, and parts of The Gap, River and Coyote Wash) had moderate to small size classes concentrated near obstructions. The Bullington pasture had the most extreme movement, with most size classes displaced and concentrated around obstructions.
- Soil surface resistance to erosion and surface structure and organic matter content: This indicator was apparent mostly in The Gap pasture. Slake test results there were 2 to 3 in interspaces and 4 under canopy cover. Soils with a stability index of 3 or less are highly susceptible to erosion, index values of 4 to 5 have a low erodibility and 5 to 6 are non-erodible. Several pastures showed evidence that the surface horizons were shallower than expected (Bullington pasture and parts of River, Raven, and Coyote Wash pastures) and received a "Moderate" rating
- Effect of plant community composition and spatial distribution on infiltration and runoff: For most sites, perennial bunchgrasses particularly cool season species were lacking, sites had more bare ground and less shrub cover than expected. Bare areas were often covered with ephemeral annual forbs or grasses that did not appear to be effective in aiding infiltration. In a few sites dominated by shrubs, one species became dominant with little herbaceous ground cover. In almost all cases, biological crust cover was absent or extremely limited. For this allotment, infiltration is greatly decreased due to adverse changes in plant community composition and distribution, detrimental plant cover changes have occurred.
- Litter cover and depth: Most sites had moderately less litter cover than expected. Litter was usually from weedy annual plants.
- Biological crust cover: In all pastures biological crust cover was greatly reduced from expected with a limited suite of lifeforms and species, occurring only in protected areas at the base of shrubs or in rocks. The Raven, Sylvie's Pocket and Coyote Wash pastures had some areas with healthy crust cover.

**2) List suspected causal factors**

Within control of agency:

- Livestock grazing
- Unauthorized livestock grazing in Coyote Wash form neighboring permittee
- Drought management, actions taken during drought

Outside of control of agency:

- Historic livestock grazing
- Prairie dog towns, mostly inactive
- Effects of previous failed land treatments
- Weeds from abandoned agricultural lands
- Impacts from old homesteads, mining, roads, power lines, seismic surveys, historic landing strips

**3) Evidence used to reach conclusions for each causal factor:**

- Livestock use documented as mostly moderate during the health assessment visit.
- Observations made and documented during 2006 land health assessment
- Precipitation records for Norwood and Uravan Colorado, the two closest active NOAA weather stations show precipitation in the area to be very close to average.

| Station | Station average | 10 year average 2004 - 2013 | 5 year average 2009 - 2013 |
|---|---|---|---|
| Norwood | 16.05 | 16.38 | Not Available |
| Uravan | 12.10 | 12.52 | 11.42 |

- Management during drought period: no use following most severe period of drought - fall winter 2002 – 2003, return to permitted levels in fall of 2003.

**Standard 3 - Healthy, productive plant and animal communities**

**1) List reasons for not meeting and indicators used**

- For the Gypsum Valleys Allotment more than half of the rated acres fell within the "Moderate", Moderate to Extreme" or "Extreme to Total" rangeland health ratings for the Biotic Integrity Attribute. This places the majority of the acres in the "at risk" or "beyond at risk" level, with recovery questionable without some changes to current management. The River and West Lavender pastures were the exceptions with less than half of the pasture acres rating "Moderate" or higher.
- The Biotic Integrity attribute in the Gypsum Valleys allotment rated "Moderate" for 50% of rated acres and "Moderate to Extreme" for 41% of rated acres (see table 2).

**Table 2**

**Proportion of acres within each health rating category by pasture for the health attribute Biotic Integrity**

| 2006 Rangeland Health | Biotic Integrity | | | | |
|---|---|---|---|---|---|
| **Gypsum Valleys Allotment Pasture** | None to Slight | Slight to Moderate | Moderate | Moderate to Extreme | Extreme to Total |
| Coyote Wash | | | 36% | 64% | |
| Sylvies Pocket | | | 57% | 43% | |
| Raven | | | 100% | | |
| Bullington | | | 73% | 27% | |
| River | | 73% | 27% | 10% | |
| Magpie | | | 52% | 48% | |
| Carnation | | 15% | 47% | 38% | |
| Dunham | | | | 100% | |
| West Lavender | | 55% | | 45% | |
| East Lavender | | | 9% | 91% | |
| Hughes Gyp | | | | 100% | |
| The Gap | | | 44% | 56% | |
| Gypsum Valleys Total | | 10% | 50% | 41% | |

- Indicators contributing to the rating: (see attached table A for details about each indicator and rating by pasture, field sheets with photos are filed)
  - Soil surface resistance to erosion and surface structure and organic matter content: This indicator was a factor mostly in The Gap pasture. Slake test results there were 2 to 3 in interspaces and 4 under canopy cover resulting in an "Moderate to Extreme" rating. Soils with a stability index of 3 or less are highly susceptible to erosion, index values of 4 to 5 have a low erodibility and 5 to 6 are non-erodible. Several pastures showed evidence that the surface horizons were shallower than expected, Bullington pasture and parts of River, Raven, and Coyote Wash pastures, and received a "Moderate" rating.
  - Functional / structural groups: Ratings ranged from " Moderate" to "Moderate to Extreme" to "Extreme to Total" with the majority being in "Moderate to Extreme". Cool season grass species were typically only in trace amounts to minor, warm season grasses were usually present but species diversity was limited, annual grasses and weedy annual forbs tended to dominate in places and many shrubs were dead or decadent with limited reproduction.
  - Plant mortality and decadence: Ratings ranged from " Moderate" to "Moderate to Extreme" to "Extreme to Total" with the majority split between "Moderate" and "Moderate to

Extreme". It was common to see dead perennial bunchgrass bases; both warm and cool season species. It was also common to see shrubs in a decadent condition with some dead.

- Litter cover and depth: Most sites had moderately less litter cover than expected. Litter was usually from weedy annual plants.
- Annual production: This indicator was a factor for about half of the pastures, The Gap, Hughes Gyp, East Lavender, Bullington and Coyote Wash. Production was 20 to 40% of potential on the pastures in the south end and 40 to 60% for Bullington and Coyote Wash. Very often most of the production was made up of annual species.
- Invasive plants: This indicator was a factor for all pastures except Sylvie's pocket and West Lavender. Ratings ranged from " Moderate" to "Moderate to Extreme" to "Extreme to Total". Weedy annual forbs such as Russian thistle, purslane and filaree and the annual grasses cheatgrass and six weeks fescue were predominant.
- Reproductive capability: The capability to produce seed was somewhat limited to greatly reduced particularly in the southern pastures and Bullington.
- Biological crust cover: In all pastures biological crust cover was greatly reduced from expected with a limited suite of lifeforms and species, occurring only in protected areas at the base of shrubs or in rocks. The Raven, Sylvie's Pocket and Coyote Wash pastures had some areas with healthy crust cover.

- Trend: There are eleven trend studies on this allotment that monitor species composition, number of plants present and ground cover amounts, all have been recently updated. Two transects show a stable or stable to upward trend, one is stable but in such a degraded condition change is unlikely and seven show a downward or stable to downward trend. A downward trend indicates a loss in the number of species or a significant change in the number of plants on the transect (see table 3). Complete detailed summaries of all trend transects are attached.

**Table 3**

| Gypsum Valleys Allotment Trend | | |
|---|---|---|
| Direction of Trend | Number of Studies | Pasture |
| Downward | 3 | Bullington 2, Carnation & Raven |
| Stable to downward | 4 | Bullington 1, East Lavender, Gap 1, Gap 2 |
| Stable degraded | 1 | Coyote Wash |
| Stable | 3 | Magpie, River & Silvey's Pocket |

**2) List suspected causal factors**

Within control of agency:

- Livestock grazing
- Unauthorized livestock grazing in Coyote Wash from a neighboring permittee.
- Drought management, actions taken during drought

Outside of control of agency:

- Historic livestock grazing
- Prairie dog towns, most currently inactive
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**3) Evidence used to reach conclusions for each causal factor:**

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| Station | Station average | 10 year average 2004 - 2013 | 5 year average 2009 - 2013 |
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| Norwood | 16.05 | 16.38 | Not Available |
| Uravan | 12.10 | 12.52 | 11.42 |

- Management during drought period: no use following most severe period of drought - fall winter 2002 – 2003, return to permitted levels in fall of 2003.

**Standard 4 - Special status, threatened and endangered species**

While the allotment as a whole met the Standard, there were significant issues involving rare plants and lichens on gypsum soils in the Magpie pastures. The lichen species *Lecanora gypsicola* (G1S1) and *Acarospora nodulosa* var. *nodulosa* (G5S1), the grass *Sporobolus nealleyi* (G5S1) and the forb *Cryptantha gypsophila* (G1G2 S1S2) are restricted to gypsum soils and are placed at risk by the recreational off-road use of the gypsum hills in this pasture. Evidence used to reach this conclusion includes obvious OHV tracks traversing gypsum hills and an increase in the number of those tracks every year.

**Statement of Conformance or Non-Conformance with Guidelines:**

1) Is it more likely than not that existing grazing management practices or levels of grazing use are significant factors in failing to achieve the Standards or conform with the Guidelines
Yes __X__ No _____

Also significant factors are the lingering effects of failed land treatment projects, historic grazing practices; and likely the re-initiation of livestock grazing too quickly after the drought of 2002-2003, when, in retrospect, high levels of natural mortality amongst native perennial forage and browse plants, coupled with low vigor in surviving plants, left plant communities vulnerable to invasion from increaser and invader classes of annual plant species. County roads, mining-related roads and motorized recreation routes are also factors contributing to the failure of some areas to achieve Standards.

2) Is it more likely than not that existing grazing management needs to be modified to ensure that the fundamentals of rangeland health are met, or making significant progress toward being met
Yes __X__ No _____

It appears that current grazing management has negatively impacted land health. Contributing factors appear to include poor distribution, lack of variety in the dates certain pastures are grazed from year-to-year; and unreliable livestock water in some pastures, leading to excessive grazing pressure in other pastures.

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6.26.15
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